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Achyranthes aspera Linn. (Chirchira): A Magic Herb in Folk Medicine

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ABSTRACT

Herbs are vital source of drugs from the ancient time holding the scenario of the Indian system of medicine. *Achyrantes aspera* Linn., known as Chirchira in Hindi, is an indigenous herb found in India. Chirchira is the basic composition of many traditional remedies. The present paper enumerates the ethnopharmacognostic, ethnopharmacologic, traditional value and folk remedies of this herb, which may help the researchers to set their minds for approaching the utility, efficacy and potency of herb.

Key Words: *Achyrantes aspera*, chirchira, traditional and folk remedies, ailments.

INTRODUCTION

The ethnic and rural people of India have preserved a large bulk of traditional knowledge of medicinal uses of plants growing around them. This knowledge is handed down to generations through word of mouth and is extensively used for the treatment of common diseases and conditions. Chirchira has occupied a pivotal position in Indian culture and folk medicine. It has been used in all most all the traditional system of medicine viz., ayurveda, unani and sidha. From the ancient time the tribal, rural and aboriginal people of our country commonly use this herb in various disorders. Chirchira, botanically known as *Achyranthes aspera* Linn. (*A. canescens* R Br., *A. argentea* Decne, *A. grandifolia* Moz, *A. obovata* Peter and *A. repea* L.) belongs to family Amaranthaceae. In the country it is known by different names such as chirchita (Hindi), apamarga (Sanskrit), aghedi (Gujarati), apang (Bengali),

nayurivi (Tamil) and kalalat (Malyalam). It grows as wasteland herb every where. Since time immemorial, it is in use as folk medicine. It holds a reputed position as medicinal herb in different systems of medicine inIndia. According to Ayurveda, it is bitter, pungent, heating, laxative, stomachic, carminative and useful for the treatment of vomiting, bronchitis, heart disease, piles, itching abdominal pains, ascites, dyspepsia, dysentery, blood diseases etc. (Bhandari, 1990; Dwivedi *et. al.,* 2007). The plant has been mentioned in manuscripts of Ayurveda and Chinese medicines. In Ayurveda, two varieties, red and white are mentioned. In Sanskrit, synonyms describe this as a rough flowered stalk. It is described in 'Nighantas' as purgative, pungent, digestive, a remedy for inflammation of the internal organs, piles, itch, abdominal enlargements and enlarged cervical glands. Hindus used ashes for preparing caustic alkaline preparations. The diuretic properties of the plant are well known to the natives of India and European physicians. Different parts of the plant form ingredients in many native prescriptions in combination with more active remedies (Agharkar, 1991).

PHARMACOGNOSY

Chirchira is an erect herb, 0.3-1meter high with stiff branches terete or absolutely quadrangular, striate, pubescent, leaves few, usually thick, elliptic-obovate, petiolate, acute and entire. Flowers are greenish white, numerous in small dense auxiliary heads or spikes, bracts and bracteoles persisting ending in a spine. Main root is long cylindrical thick; secondary and tertiary roots present slightly ribbed, yellowish brown in color; odor is slight, taste is slightly sweet and mucilaginous; stem is yellow brownish, erect branched, cylindrical hairy about 60 cm high. Seeds are sub cylindrical, truncats at apex, rounded at base, black and shining. The plant is distributed through out India up to an altitude of 3000ft.

Prasad and Bhatacharya (1961) studied the plant pharmacognostically and observed an average stomata index of 6.6, average palisade ratio of 9.2, average vein islet no 9 and average epidermal cell count 360. Paliwal*et. al.* (1960) worked on the structure and development of stomata and reported the leaves to be amphistomatic. Joshi (1931) and Dastur (1935) worked on trichmoes, and Karnick *et. al.* (1976) studied the effect of different lunar phases on the growth of plant.

Part used: Whole plant, leaves, seeds, roots, flowers and fruits.

PHYTOCHEMISTRY

The plant contains triterpenoid saponins possessing oleanolic acid as aglycone, viz. A, B, C and D as major chemical constituents. Other constituents of the plant are ecdysterone, long chain alcohol, viz. 17-penta triacontanol, 27-cyclohexyl heptaeosan-7-ol, 16-hydroxyl 26-methyl heptacosan-2one and 36, 47-dihydroxy hen-pentacontan-4one. It also contains a water soluble base, betaine. The chemical constituents of *A. aspera* are shown in Table 1.

Table 1: Chemical constituents of *Achyranthes aspera* Linn.

S. No.	Constituents	References
1.	Saponins from alcoholic extract of defatted seeds	Gopalanchari and Dhar (1958)
2.	Oleanic acid from seeds	Khastgir *et. al*. (1950)
3.	Saponins A and B	Hariharan and Rangaswami (1970)
4.	Saponins C and D from unripe fruits	Sheshadri *et al.* (1981)

5.	AA, CHO, protein, Fe, Ca, phosphorous	Satyanaryana *et. al.* (1964)
6.	Achyranthine, N-methyl pyrrolidine –3 carboxylic acid	Basu (1957)
7.	Water soluble base, betaine	Kappor and Singh (1966)
8.	Vitamin C	Hasan (1962)
9.	Ecdysterone	Banerjee and Chandha (1970)
10.	Inokosterone ecdysterone in callus and tissue culture	Hiroshi *et. al*. (1971)
11.	Enzyme level	Purohit *et. al.* (1980)

PHARMACOLOGY

From the point of view of pharmacological activity of *A. aspera*, a number of works have been done. Some of the reported pharmacological activities of *A. aspera* are mentioned in Table 2.

Table 2: Pharmacological activities of *Achyranthes aspera* Linn.

S. No.	Pharmacological Activity	References
1.	Abortifacient	Basu *et al.* (1957), Bhattacharya (1977), Kapoor and Singh (1967), Pakrashi *et al.* (1975)
2.	Cardiovascular	Basu *et al.* (1957), Kapoor and Singh (1966), Neogi *et al*. (1970), Ram *et al.* (1971 & !972)
3.	Effect on urinary tract	Ghosh *et al*. (1980), Kapoor and Singh (1967), Ram and Tripathi (1972)
4.	Antibacterial and antifungal	Dhar *et al.* (1968), George *et al.* (1947), Neogi and Shrivastava (1957), Ikram and Haq (1980), Khurana *et al.* (1970)
5.	Juvenile	Banerjee *et al.* (1971), Masatoshi *et al.* (1967), Otaka *et al.* (1980), Rajendran and Gopalan (1970), Robins *et al.* (1968), Sekeris *et al.* (1961), Takemoto *et al.* (1967)
6.	Antidiabetic	Dhar *et al.* (1968), El-Kheir and Salik (1980)
7.	Spasmolytic	Neogi *et al.* (1970), Singh (1967)
8.	Antiasthmatic	Chayaralu (1982), Mahaskar and Caius (1931)
9.	Antiallergic	Saha and Kalyansundaram (1962)
10.	Astringent	Chopra *et al.* (1958)
11.	Emetic	Chopra *et al.* (1958)
12.	Abdominal tumor	Hartwell (1976)
13.	Chemoprotective	Chakaborty *et al* (2002)
14.	Diuretic	Nadkarni (2005)
15.	Antiperiodic	Nadkarni (2005)
16.	Purgative	Nadkarni (2005)

Safety Aspects:

This plant is known to possess abortifacient and contraceptive properties, and hence should be avoided during pregnancy. However, the drug is devoid of any side effect up to the dose of 8 g/kg, orally in rabbits (Akhitar *et al.*, 1991).

FOLK REMEDIES AND TRADITIONAL USES

The herb is widely used to treat various kinds of ailments. Various traditional uses of the herb are mentioned in Table 3, given below:

Table 3: Folk remedies and traditional uses of *Achyranthes aspera* Linn.

S. No.	Part used	Preparation	Use	References
1.	Whole plant	Decoction boiled with water for 20-30 min. taken at night	Diuretic in renal dropsies and general anasarca	Nadkarni (2005)
2.	Whole plant	Decoction taken two tablespoon three times a day	Beriberi	Dwivedi (2004)
3.	Whole plant	Decoction boiled with water and taken twice a day	Pneumonia	Rangari (2006)
4.	Whole plant	Infusion in water taken thrice a day	Bronchial infection	Gopalachari & Dhar (1958)
5.	Whole plant	Powder with lukewarm water or milk taken twice a day	Blindness in cattle and rheumatism	Shankar (1979), Jain & Tarafdar (1970)
6.	Whole plant	Ash of plant with honey twice a day	Cough	Chopra (1933)
7.	Whole plant	Juice taken thrice a day	Toothache	Rangari (2006)
8.	Roots	Decoction boiled with water and taken twice a day	Pneumonia	Haerdi & Eingeborenosis (1964)
9.	Roots	Two teaspoonful powder taken once at night	Astringent and bowel complaints	Quisumbing (1951)
10.	Roots	Two teaspoonful powder taken once at night	Stomachic and digestive	Chopra (1933)
11.	Roots	Extraction of roots taken at night	Menstrual disorders	Singh & Singh (1981)
12.	Roots	Powder taken with water daily	Leprosy	Rao (1981)
13.	Roots	Paste taken with water daily	Antifertility	Malhi & Trivedi (1972)
14.	Roots	Infusion in water taken thrice a day	Mild astringent	Nadkari (2005)
15.	Roots	Ashes mixed with water	Cough, ascites and anasarca	Nadkarni (2005)
16.	Roots	Powder taken twice a daily	Bleeding in delivery	Dwivedi (2003)
17.	Leaves	Juice mixed with opium taken twice with water	Syphilitic sores	Nadkarni (2005)
18.	Leaves	Juice mixed with opium taken twice with water	Gonorrhoea	Rangari (2006)
19.	Leaves	Juice taken with water ay bed time	Bowel complaint, pile, boil, stomache, skin eruption	Nadkari (2005)
20.	Leaves	Decoction of powdered leaves taken twice day	Early stages of diarrhoea and dysentery	Nadarni (2005)
21.	Leaves	Fresh leaves mixed with jaggery or black peppery and garlic and made pills taken twice a day	Antiperiodic	Nadkarni (2005)
22.	Seeds	Raw seeds taken with water	Expectorants	Nadkarni (2005)

		daily		
23.	Seeds	Raw seeds taken thrice a day	Brain Tonic	Mishra (1969)
24.	Seeds	Raw seeds taken twice a day	Bleeding piles	Mishra (1969)
25.	Flowers	Crushed flowers paste taken daily	Menorrhagia	Rangari (2006)
26.	Flowers	Grounded into paste as external use	Snakes and reptiles bites	Nadkarni (2005)
27.	Fruits	Unripe fruits taken thrice daily	Respiratory disease	Rangari (2006)

CONCLUSION

Herbs are the natural drugs used to regain the alterations made in normal physiological system by foreign organisms or by any malfunctioning of the body. In every ethnic group there exists a traditional health care system, which is culturally patterned. In rural communities, health care seems to be the first and foremost line of defense. The WHO has already recognized the contribution of traditional health care in tribal communities. It is very essential to have a proper documentation of medicinal plants and to know their potential for the improvement of health and hygiene through an eco friendly system. Thus importance should be given to the potentiality of ethnomedicinal studies as these can provide a very effective strategy for the discovery of useful medicinally active identity. A detailed and systematic study is required for identification, cataloguing and documentation of plants, which may provide a meaningful way for the promotion of the traditional knowledge of the herbal medicinal plants. The present review reveals that the herb chirchira is used in treating various ailments. It elicits on all the aspects of the herb and throws the attention to set the mind of the researchers to carry out the work for developing its various formulations, which can ultimately be beneficial for the human beings as well as animals.

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REFERENCES

Akhtar MS, Iqbal JJ, *Ethanopharmacol*, 31, 1991, 49.

Agharkar, SP, Medicinal plants of Bombay presidency,Scientific Publishers, Jodhpur, India,1991,7-8.

Banerjee A and Chadha MS, *Phytochem*, 9(7), 1970, 1671.

Banerjii A, Chitalwar GJ, Joshi, AK, Chandha MS, *Phytochem.* 10(9), 1971, 22-25.

Basu NK, Singh K, Agrwal OP, *J. Proc. Inst. Chemist* 29(1), 1957, 55.

Bhattacharya N and Pakrasti A, J *Exp Biol.,* 15(10), 1977,856.

Bhandari M.M, Flora of the Indian desert, MPS Repros, Jodhpur, India, 1990, 287-288.

Chakraborty A *et.al.,* Cancer chemo preventive activity of Achyranthes aspera leaves on Espstein bar virus activation and two stages mouse skin carcinogenesis, *Cancer Lett.* 177(1), 2002, 25-31

Chopra RN, Chopra IC, Handa KL, Kapoor LD, Chopra's Indigenous drug of India, U.N. Dhar & Sons Pvt. Ltd. Calcuta, 2nd ed. 1958, 493.

Charyarau GP, Ind. J. *Pharm Sci,* 44(1), 1982.

Chopra, R N Indigenous drug of India, Calcutta, 1933.

Dwivedi SN, Ethnobotanical studies and conservational strategies of wild and naturnal resources of Rewa district of Madhya Pradesh, *J. Econ. Tax. Bot*., 27(1), 2003, 233-234.

Dwivedi SN, Herbal remedies among tribals of sidhi district of Madhya Pradesh, *J. Econ. Tax.* 28(3), 2004, 675-686.

Dwivedi S *et. al.*, Relivance of medicinal herbs used in traditional system of medicine, Farmavita. Net, 2007.

Dastur RH, *Annals Bot. Soc.* 39, 1935, 539.

Dhar ML, Dhar MM, Dhawan, BN, Merhortru BN, Roy C, *J. Exp. Bio*, 5(4), 1968, 675-686.

El-Kheir, VM, Salik MH, *Fitoterpia*, 51(3), 1980, 43.

Hasan F, *Pakistan J Sci Res*., 14(1), 1962, 4.

George M *et.al.*, J.Sci. *Indust.* Res. 63(3), 1947, 42.

Gopalanchari R, Dhar, ML, *J.Sci Indust. Res.* 17(B), 1985, 276.

Ghosh A, Sengupta P, Chatterjee, S, Ghoshal KK, Probe, 19(4), 1980, 270.

Hariharan V, Rangaswami S, *Phytochem* 9(2), 1970, 379.

Hiroshi H, Hisanon J, Takemota T, *Chem. Pharm. Bull*., 19(12), 1971, 438.

Hartwell JL *Lloydia*, 30(4), 1970, 371.

Haerdi F, Eingerborenon D, *Acta Tropic Suppl*. 8(1), 1964, 278.

Ikram M, Haq I., *Fitoterpia*, 51(5), 1980, 231.

Jain SK, Tarafdar CR, *Econ. Bot*. 24(3), 1970, 241.

Joshi AC, J. *Ind. Bot. Soc*., 10, 1931, 1265.

Khurana LM, Paul SM, Bhargawa KS,*J. App. Microbiology*, 16(3), 1970, 255.

Karnic CR, Jopat PD, *Indian Drug Pharm Ind*, 25, 1976, 293.

Kappor VK, Singh HK, *Ind. J. Chem.* 4(10), 1966,461.

Kapoor VK, Singh HK, *Ind. J. Pharm* 29(10), 1967, 281.

Khastgir H, Sengupta SK, Sengupta P, *J Ind. Che. Soc*. 35, 1958, 693.

Malhi BS, Trivedi VP, *Quert crude Drug Res.* 12(1), 1972.523.

Mishra MN, Bihari RJ, *Sci. Tech,* 7B (3), 1964, 195.

Masatoshi K, Takemato T, Ogawa S, Nishimato N, I Inset, Physiol, 13(9), 1967,1395.

Mahaskar KS, Caius JF, *Ind. Med. Res. Memo*,19, 1931,10.

Nadkarni KM, Indian Materia medica , Vol -I, Bombay popular prakashan, 2005, 21-22.

Neogi NC, Gar RD, Rathor RS, *Ind J Pharm* 32(2), 1970, 43.

Neogi NC, Shrivastava VP,Baser NK, *J Proc Inst Chem* 29(5), 1957,191.

Otaka T, Uchiyama, M, Okari, S, Takemoto, T, Hikino, H, Ogowa, S, Nishimoto N, *Chem Pharm Bull*, Tapan, 16, 1980, 2426.

Paliwal G S, Gupta BP, Males CB, *Int. J. For*. 3(2), 1980,135.

Prasad S, Bhattacharya IC, *J Sci. Indust. Res.* 20C (8), 1961, 246.

Purohit S, Bhattacharya I C, *J Sci Ind Res*, 20C (8), 1980, 246.

Pakrashi A, Mookerjii N, Basak BJ, Repord Fert, 43, 1975,1270.

Quisumbing E, Tech Bull, Phillips Dep. *Agri Natur Res*., 16, 1951.

Rangari VD, Pharmacognocy and phytochemistry Part II, Ist edition, Carrer publication , 2006, 179-180.

Ram AK, Bhagwant AW, Gupta SS, *Int. J. Med res*. 60(3), 1972, 462.

Rajendran B, Gopalan M, *Ind. J. Agr. Sci*. 48 (5), 1978, 306.

Ram AK, Bhagwant AW, Gupta SS, *Int. J. Physiol. Pharmacy*, 15(3), 1971,107.

Ram A, Tripathi RM, Gupta SS, *Ind. J. Pharmacol*. 4(4), 1972, 4.

Robins WE, Kaplanis JN, Thompson TJ, Cohen, CF, Joyner SC, *Science*, 161, 1968, 1158.

Singh KK, Palvi SK, Singh HB *Ind, J. For* 4(2), 1981,115.

Sekeris CE, Lang N, Karlson P, *J Physiol Chem*, 36, 1961, 341.

Saha JC, Kalyansundaram S, *Ind. J. Med. Res*. 50(6), 1961,881.

Shankar MR, *Nagarjun*, 29(1), 1979, 9.

Sheshadri V, Batt AK, Rangaswami S, *Ind J Chem*, 20B (9), 1981,773.

Satyanarayana MS, Sushila BA, Rao, AN, Vijaraghwan, PK, *J.Food sci tech*. 1(12), 1946, 26.

Takemoto T, Ogawa S., Nishimato N, Mue K, Yakugaku Z, 87(12), 1967, 148.

Watt JM, Breyer MC, The medicinal and poisonous plant of southern and Eastern African, IIed, E&S livingst Ltd. Edinburg &London, 1963.